

Appl. No. 09/488,973

REMARKS

Claims 10-17 and 19-37 remain pending in the application.

The text of the application is amended to correct a couple of minor typographical errors.

Claims 10-17 and 19-37 stand rejected as being either anticipated by Demaray (claims 10, 16-17, 21-23, 26-27, 29-31 and 33-35); or as being unpatentable over Demaray in combination with Masuda (claims 11-15, 19-20, 24-25, 28, 32 and 36-37). The undersigned discussed various differences between the claims and the cited references in a telephone interview with the Examiner on May 30, 2002. The undersigned thanks the Examiner for the courtesy and helpful comments extended by the Examiner during the interview. As discussed during the interview, Applicant requests reconsideration of the rejections lodged against the pending claims for at least the reasons that the references do not teach all of the recited features of the claims.

Referring first to claim 10, such recites a method in which a backing plate and target materials both predominately comprise aluminum, and are thermally joined to simultaneously diffusion bond the target material to the backing plate material, and develop grains in the target material. The claim further recites that a predominate portion of developed grains in the target material have a maximum dimension of less than 100 microns.

Claim 10 is allowable over the cited references for at least the reason that the references do not suggest or disclose the recited features of claim 10 underlined in the description above of claim 10. The Examiner is reminded that anticipation under 35 U.S.C. § 102 requires that a reference teach every aspect of a claimed invention (see, for example,

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M.P.E.P. §706.02), and is also reminded that a proper rejection under 35 U.S.C. §103 requires that all of the limitations of a claim be taught or suggested by one or more prior art references (see, for example, M.P.E.P. §706.02(j)). Accordingly, both a §102 rejection and a §103 require that all of the limitations of a claim be considered by the Examiner, and be shown to be either disclosed or suggested by the prior art. In the present case, all of the limitations of claim 10 are not shown or suggested by the prior art.

Claim 10 recites, among other things, that a backing plate predominately comprising aluminum is diffusion bonded to a target material predominately comprising aluminum, and that during the diffusion bonding grains are developed in the target material, with the predominate portion of the developed grains having a maximum dimension of less than 100 microns. Neither of the Examiner's cited references suggests or discloses a target material predominately comprising aluminum diffusion bonded to a backing plate predominately comprising aluminum. For at least this reason, all of the claim 10 recited features are not shown or suggested by the recited references, and claim 10 is allowable. Further, since neither of the Examiner's cited references suggests or discloses a backing plate material predominately comprising aluminum diffusion bonded to a target material predominately comprising aluminum, it is inconceivable that the references could be considered to reasonably suggest or disclose the claim 10 recited feature of grains being developed to a maximum dimension of less than 100 microns in a target material predominately comprising aluminum as the target material is diffusion bonded to a backing plate predominately comprising aluminum. Accordingly, the cited references cannot reasonably be considered to suggest or disclose all of the recited features of claim 10. Applicant therefore requests formal allowance of claim 10 in the Examiner's next action.

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Claims 11-17 and 19-25 depend from claim 10, and are therefore allowable for at least the reasons discussed above regarding claim 10.

Referring next to claim 26, such claim recites a method wherein a physical vapor deposition target material comprising aluminum is diffusion bonded to a backing plate material comprising aluminum under conditions which adhere the backing plate material to the physical vapor deposition target material with a bond strength of at least about 5,000 pounds/inch². The claim further recites that a predominate portion of grains developed in the target material during a thermal treatment of the diffusion bonding are less than 100 microns in maximum dimension.

Claim 26 is allowable over the cited references for at least the reason that all of the recited features of claim 26 are not shown or suggested by the cited references. For instance, the references do not show or suggest the claim 26 recited diffusion bonding of an aluminum-comprising target with aluminum-comprising backing plate, and certainly don't disclose or suggest such diffusion bonding creating a recited bond strength of at least about 5,000 pounds/inch². Further, the cited references do not suggest or disclose the recited development of a predominate version of the grains in an aluminum-comprising target material to less than 100 microns in maximum dimension after thermal treatment of target and backing plate materials under the claim 26 recited conditions. As several features of claim 26 are not disclosed or suggested by the cited references, the claim is allowable. Applicant therefore requests formal allowance of claim 26 in the Examiner's next action.

Claim 27-37 depend from claim 26, and are therefore allowable for at least the reasons discussed above regarding claim 26.

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Applicant notes that the Examiner contends in the Office Action that several of the features described above relative to claims 10 and 26 as not being shown or suggested by the cited references, are in fact actually shown within the references. Applicant also notes, however, that the Examiner's contentions are stated as conclusions, and that the Examiner does not provide any specific reference to columns and line numbers within the cited references where the features of Applicant's recited claims are allegedly shown. Applicant has carefully reviewed the references, and cannot find any support in the references for the Examiner's conclusions that the references show or suggest the various recited features of aluminum-comprising targets bonded to aluminum-comprising backing plates; a predominate portion of developed grains within an aluminum-comprising target have a maximum dimension of less than 100 microns; or a bond strength between an aluminum-comprising target and aluminum-comprising backing plate is at least 5,000 pounds/inch². If the Examiner persists in the contention that such features are shown in the cited references, Applicant respectfully requests that the Examiner provide column and line numbers to the specific locations in the references which allegedly show or suggest such recited features.

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Respectfully submitted,

JUN 26 2002

TECHNOLOGY CENTER 2800

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Reg. No. 38,533

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Appl. N . 09/488,973

Application Serial No.09/488,973
Filing Date January 20, 2000
Inventor.....Chris Parfeniuk et al.
Assignee.....Honeywell International Inc.
Group Art Unit.....2823
ExaminerD. Collins
Attorney's Docket No. 30-5016-(4015)
Title: Methods of Bonding Physical Vapor Deposition Target Materials to Backing Plate
Materials

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING
RESPONSE TO APRIL 2, 2002 OFFICE ACTION

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In the Specification

TECHNOLOGY CENTER 2800

The replacement specification paragraphs incorporate the following amendments.

Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

The paragraph beginning on line 13 of page 6 is amended as follows:

A method encompassed by the present invention is described by a flow diagram in Fig. 2. At an initial step (labeled 30 in Fig. 2) work hardening is done to the a target material. If, for example, the target material comprises aluminum, work hardening can be introduced by compressing the aluminum from an initial thickness to a second thickness. Such compression is illustrated in Fig. 3, wherein a target 50 is illustrated before and after compression, with an arrow 52 provided to indicate the step of compression. Target 50 comprises a first thickness "X" prior to the compression 52 and a second thickness "Y" after the compression. The compression can be accomplished by, for example, cold forging or cold rolling. The final thickness of target 50 ("Y") can be, for example, less than 2% of the initial thickness of target 50 (i.e., a 98% compression), and is typically less than

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or equal to about 40% of the initial thickness of target 50 (i.e., a 60% compression). In particular embodiments, target 50 can be subjected to a 95% compression (i.e., compressed so that final thickness "Y" is about 5% of initial thickness "X").

The paragraph beginning on line 1 of page 9 is amended as follows:

Assembly 70 ~~is~~ can be formed in, or placed in, an atmosphere which is inert relative to oxide formation from materials of plate 60 and target 50. In embodiments in which plate 60 and target 50 comprise high-purity aluminum, or aluminum alloys, the inert atmosphere can comprise a vacuum, or consist essentially of, for example, one or more of nitrogen gas and argon gas. The inert atmosphere preferably does not comprise oxidative components (like oxygen), as such could adversely cause oxidation of the materials of one or both of the blank 60 and target 50.

In the Claims

No changes are made to the claims.

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